REMARKS

Claim 1 calls for attaching ligands along a polymer bristle to form a semiconductor wafer cleaning brush.

With respect to the two cited references neither of them teaches a brush, either inherently or on any basis. Andros clearly says he teaches a sponge. There are no bristles and there are no ligands attached to polymer bristles.

With respect to Wang, the Examiner points out, in paragraph 8, that in one embodiment a polishing pad is described. The polishing pad comprises grooved polymeric surfaces. It is not seen where bristles can be found or can be suggested to be inherent. In short, there is absolutely no basis for suggesting that either reference teaches bristles or cleaning brushes.

Moreover, neither reference teaches attaching ligands to a polymer bristle. It appears that the office action equates ligands to any charged particle. To the contrary, as indicated in the reply mailed August 16, 2006, the Dictionary of Scientific and Technical Terms defines a ligand as a molecule, ion, or group bound to the central atom in a chelate or a coordination compound. Thus, any charged particle situation does not create a ligand.

With respect to the cited reference to Wang, it is suggested that the use of ligands is taught in paragraph 8. Nothing about the so-called polishing brush is set forth in paragraph 8. It appears that Wang teaches two embodiments, one of which is a CMP compound and one of which is a polishing pad. The polishing pad embodiment seems to begin at paragraph 72. There, it is explained that the ion exchange material described may implement a cleaning pad comprising a base with a layer of ion exchange material disposed on the base. In paragraph 75 it is explained that the material may be in the form of a pore sheet or a plurality of pore sheets laminated or otherwise coupled to a base material. It is not seen how anything in this material suggests the use of ligands or the use of ligands attached to bristles or even polymeric material.

In paragraph 77, it is suggested that, alternatively, the cleaning or buffering pad may include the ion exchange material "embedded or impregnated in a binding material having a porous nature, such as a porous polymeric material, to form a porous pad." But, again, there is nothing to suggest attaching ligands to the bristles, as opposed to mixing some type of material into a binder, which is then mixed into polymeric material to make a pad. For example, it suggests a polyurethane pad having ion exchange particles disposed therein (not thereon).

Most importantly, however, nothing in Wang ever suggests any ligands, chelates, or coordination compounds are involved in any way. The suggestion that an ion exchange material has electrically charged groups, as indicated in paragraph 4 of the office action, is noted. Still, there is no reason to believe that an ion exchange material has ligands in particular, even if it has electrically charged groups.

Similarly, the suggestion in paragraph 12 that because there is a carbon atom linking polymer chains that this is somehow a ligand is, again, incorrect. A ligand involves a coordination compound which involves a metal central atom or molecule. See the attached material on coordination compounds from the Purdue University website.

Therefore, there is no basis for the rejection based on Wang and reconsideration would be appropriate.

Turning now to the rejection based on Andros, the suggestion is offered that the ligand "can be considered the cross-linked polymer in Figure 3. There seems to be no technical basis for this suggestion. See office action at page 12. Just because you have a central carbon atom does not suggest a coordination compound having a central metal atom. Nothing in Andros ever suggests that there is any chelate, coordination compound, or ligand involved. There appears to be no basis for such a conclusion. Certainly, the suggestion that cross-linking is commensurate with ligand-type attachment in unsupported and is inconsistent, for example, with the Purdue University material.

The assertion that the zeta potential is used incorrectly is noted, but reconsideration is respectfully requested in view of the amendments which attempt to adopt the suggestion of paragraph 7 of the office action.

Therefore, reconsideration of the Section 112 rejection is also requested.

Respectfully submitted,

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What Is A Coordination Compound?

A ***coordination complex*** is the product of a Lewis acid-base reaction in which neutral molecules or anions (called ***ligands***) bond to a central metal atom (or ion) by ***coordinate covalent bonds***.

- Ligands are Lewis bases - they contain at least one pair of electrons to donate to a metal atom/ion. Ligands are also called ***complexing agents***.
- Metal atoms/ions are Lewis acids - they can accept pairs of electrons from Lewis bases.
- Within a ligand, the atom that is directly bonded to the metal atom/ion is called the ***donor atom***.
- A coordinate covalent bond is a covalent bond in which one atom (i.e., the donor atom) supplies both electrons. This type of bonding is different from a normal covalent bond in which each atom supplies one electron.
- If the coordination complex carries a net charge, the complex is called a ***complex ion***.
- Compounds that contain a coordination complex are called ***coordination compounds***.

Coordination compounds and complexes are distinct chemical species - their properties and behavior are different from the metal atom/ion and ligands from which they are composed.

The ***coordination sphere*** of a coordination compound or complex consists of the central metal atom/ion plus its attached ligands. The coordination sphere is usually enclosed in brackets when written in a formula.

The ***coordination number*** is the number of donor atoms bonded to the central metal atom/ion.

Some Coordination Complexes

example	molecular formula	Lewis base/ligand	Lewis acid	donor atom	coordination number
	$[Ag(NH_3)_2]^+$	NH_3	Ag^+	N	2

					
	$[Zn(CN)_4]^{2-}$	CN^-	Zn^{2+}	C	4
	$[Ni(CN)_4]^{2-}$	CN^-	Ni^{2+}	C	4
	$[PtCl_6]^{2-}$	Cl^-	Pt^{4+}	Cl	6

	$[Ni(NH_3)_6]^{2+}$	NH_3	Ni^{2+}	N	6